

ACD MANAGEMENT INFORMATION SYSTEM

BACKGROUND OF THE INVENTION

This invention relates to a management information system (MIS) for use in conjunction with an automatic call distribution system (ACD).

Automatic call distributors (ACD) marketed in the past few years have included management information systems which are typically minicomputer-based adjuncts to the ACD. These MISs operate to collect various statistics about the call traffic through the ACD switch.

In management information systems, the emphasis placed on the type of information gathering is a function of the environment which the ACD faces and the objectives of the ACD managers. Typically, historical information is gathered to provide data useful in evaluating performance or service quality over some period of time. Various operations may be interested in these reports over half hour intervals, over an entire shift, for a whole day, a week or even a month. To allow for such information, display data bases are established to store the pertinent data from which the reports may be generated. Thus, time periods, or windows, are constructed and certain statistics are monitored during these periods for later presentation to a manager. Some of these statistics relate to hold times of each call and to the average speed of answer of the incoming calls.

ACD management problems are enhanced in small ACDs (with fewer than 50 stations) since the agent of the small ACD must typically handle a variety of non-ACD job responsibilities. These agents may be required to handle walk-in business or to make outgoing calls for the purpose of bill collecting or advertising in addition to handling incoming calls. During these activities the agent's console would not be available to receive ACD calls. Thus since the ACD traffic is not static, over time the manager must know at any instant exactly how the system is configured. This requirement, then, suggests an information arrangement which allows for rapid, "real time" rearrangement of ACD agents.

Even in the largest installations it is expensive to provide comprehensive information to satisfy all managers. The primary issue which faces the MIS designer, then, is how to allocate available resources to the various types of reports and how to present the information to the manager in a meaningful manner. Thus, it is necessary to know exactly what information is required for proper management control and to know when to update the information so as not to confuse the system manager with constantly changing meaningless information.

When using a video display screen to present the necessary data to the manager, it is important that the display not change every time a piece of information changes, while at the same time provision must be made to immediately update certain highly relevant information. These opposed criteria then impose severe restrictions on the design of any management information system and make the selection and presentation of information vitally important.

SUMMARY OF THE INVENTION

We have designed a real time responsive management information system (MIS) which effectively balances the competing data base gathering factors into a compact, easy to manage, system. We have accomplished

this result by carefully imposing rules for defining real time control and for displaying, to a manager on a single display, the information necessary to show dynamic system operation thereby allowing for an immediate response by the manager. Using our system, the manager has the ability to observe and change:

- (1) the number and split assignment of all trunks terminating on the ACD,
- (2) the number of agents assigned to each split and their job assignments, and
- (3) the parameters (such as overflow thresholds) which control traffic routing patterns through the switch.

These changes can be effected rapidly in order for the control to be in real time, and the system allows the manager immediately to observe the effects of any system changes.

Our system, in one embodiment, consists of a processor and data base, a video display terminal, and a set of data links to at least one ACD switching system. A single view provides the displayed information necessary for the system manager to understand the dynamics of the system and to make the appropriate changes.

In providing information for a data base the temptation is to give the viewer more data than the viewer needs or could possibly use and to display it in a manner which is confusing. This problem is compounded in situations where the information is constantly changing and where it is desired to provide the latest data.

This problem is overcome by separating the displayed information into segments, and providing within each segment, information pertaining to related parameters. The information is carefully selected to insure that the delay is not cluttered with numbers which only serve to add confusion to a dynamic situation. The segments have been arranged to be updated in sections such that for some bits of information the update occurs almost immediately, while for other bits of information the update is delayed for a short period of time. In this manner the display is updated, bit by bit, with the critical information being changed almost immediately upon occurrence. One advantage of this arrangement is that the screen does not go blank while the display is being reformatted. Thus the system manager can watch the display to see the changes as they actually occur, thereby obtaining a dynamic "feel" of the system.

This dynamic update is difficult to achieve since the actual position of certain bits of information on the display screen may change as various system configurations change. Thus, the display becomes more than simply reading a data base onto a video screen.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention and its several other objects, features and advantages will be more fully understood from a reading of the following description to one embodiment taken in conjunction with the drawing in which:

FIG. 1 shows an overall system schematic of management information system (MIS) having many ACD switching systems;

FIG. 2 shows details of one ACD switching system including the interface to the MIS;

FIG. 3 shows a blocked diagram of the management information system with major software modules superimposed on the processor;

FIGS. 4, 5, and 6 show details of the MIS;

FIGS. 7, 8, and 9 show state information pertaining to changed data;